



#26/Appeal
Brief
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Patent
Attorney's Docket No. 018656-107

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)
Manami KUISEKO et al.) Group Art Unit: 2873
Application No.: 09/450,271) Examiner: Timothy J. Thompson
Filed: November 26, 1999) Appeal No.
For: REFLECTING MICROOPTICAL)
SYSTEM)

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BRIEF FOR APPELLANT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This appeal is from the decision of the Primary Examiner dated September 16, 2002, finally rejecting claims 1, 2, 13, 14, and 21-26, which are reproduced as an Appendix to this brief.

A check covering the [] \$160.00 (2402) [X] \$320.00 (1402) Government fee and two extra copies of this brief are being filed herewith.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. This paper is submitted in triplicate.

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I. Real Party in Interest

The subject application, and the invention claimed therein, is assigned to Minolta Company, Ltd., a Japanese Corporation.

II. Related Appeals and Interferences

There are no other appeals or interferences known to Appellants, their assignee, or their legal representative which will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

III. Status of Claims

The present application contains 28 claims. Of these, claims 3-8, 11, 12, 15-20 and 27 have been canceled. Pending claims 1, 2, 13, 14, and 21-26 stand finally rejected.

The status of pending claims 9, 10 and 28 is unclear. In the Office Actions dated April 17, 2002 and August 19, 2002, these three claims were rejected solely under 35 U.S.C. §112. That rejection was overcome in the response filed August 19, 2002. The final Office Action dated September 16, 2002 does not set forth any rejection of these claims. However, the Office Action Summary indicates that these claims are rejected. Thus, it is unclear whether the examiner intended to reject these claims, and if so on what grounds.

IV. Status of Amendments

There were no amendments filed subsequent to the final Office Action.

V. Summary of the Invention

The claimed invention is directed to a reflective optical system. While not limited thereto, the reflective optical system of the present invention is particularly well suited for microoptical systems, such as high-density optical recording pickup devices. The disclosed optical system comprises a lens element that presents a continuous configuration having

only two optical surfaces. A particular advantage of such a configuration is that it is readily adapted to glass molding. (Page 12, lines 13-15)

A representative example of the optical system of the invention is depicted in Figure 19. Referring thereto, the lens element has a first surface S1 that is closest to the long conjugate distance side, i.e. the light source side, and a second surface S2. The hatched areas in the figure depict a reflective coating that is applied to these two surfaces. As can be seen, the reflective coating is applied in the vicinity of the optical axis AX on the first surface, and at the periphery of the second surface S2. (Page 3, lines 10-19)

Figure 1 illustrates the path of light rays entering the reflective optical system. The rays enter the first surface S1 at its periphery, and are reflected at the peripheral part of the second surface S2. The light is again reflected at the central part of the first surface S1, and is imaged in the vicinity of the vertex of the second surface S2, i.e. along the optical axis AX. (Page 4, lines 3-7)

The surfaces S1 and S2 can be planar, convex or concave. Figures 1, 3, 5, 7, 9, 11, 13, 15 and 17 illustrate various embodiments having different combinations of planar, convex and concave surfaces.

As a further feature of some of the claimed embodiments, at least one of the surfaces is aspherical. In the various disclosed embodiments, the surfaces having an aspherical shape are marked with an asterisk, e.g. S1* or S2*. (Page 3, lines 10-12)

VI. The Issues

The final Office Action presents the following two issues for review on this appeal:

1. Is Claim 25 anticipated by the Braun patent, U.S. Patent No. 4,121,890?
2. Are Claims 1, 2, 13, 14, 21-24 and 26 unpatentable under 35 U.S.C. §103, when the Braun patent is considered in view of the Medina Puerta et al. patent, U.S. Patent No. 5,638,219?

VII. Grouping of Claims

Appellants do not consider all claims grouped in the rejection under 35 U.S.C. §103 to stand or fall together. The bases for the separate patentability of different ones of these claims are set forth in the following arguments.

VIII. Argument

A. Claim 25 Is Not Anticipated by the Braun Patent

Claim 25 stands finally rejected under 35 U.S.C. §102, as being anticipated by the Braun patent. This claim recites an optical system comprising a lens element having a first concave surface on the long conjugate distant side thereof, i.e. the first side S1, and a second convex surface on the opposite side thereof. The first recited surface has a reflective coating on a central portion thereof and a light emitting area on the concave surface at the periphery of the reflective coating. The second surface has a reflective coating on a peripheral portion thereof, and a light transmissive region at the central portion thereof. Examples of such an optical element are disclosed with reference to Figures 15 and 17 of the application.

The Braun patent is directed to a range boresight test unit for optical laser rangefinders. In relevant part, at Figure 1 it discloses an optical structure 20 which is described as a "thick lens having a spherical shaped surface 22." (Column 2, lines 41-42). A pulse of laser energy 14 is applied to a first surface 18 of the optical structure. The patent describes the operation that takes place within the lens 20 as follows:

The pulse of the waveform 14 proceeds through the optical structure 20 to the second side surface 22 having a spherical shape. The illustrated path in Fig. 1 as well as in the other figures is that of a typical light ray. At the second side surface 22, some of the light is transmitted out of the optical means, but due to reflection a substantial portion of the light is reflected back towards the first surface 18. When the light again reaches the first surface 18 some of it is transmitted out of the optical means; but again a portion is reflected to the surface 22. This process may be repeated any desired number

of times depending on the design configuration of the optical structure 20. Simultaneously the light is gradually being focused to a focal point, such as 24 due to the curved reflective surface 22.

(Column 2, lines 42-57)

The rejection of claim 25 states "Braun discloses a lens element for focusing incident luminous flux at a predetermined position (fig. 1, 24), the lens element having a first concave surface (fig. 1, 18, col 4, lines 33 and 34, *since surface can be curved it inherently could then be concave*)" (emphasis added). At column 4, lines 33-34, the Braun patent states "The surface 18 in some arrangements in accordance with the invention may be curved."

As set forth in MPEP §2112, "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic" (emphasis in original). Rather, the Manual goes on to state "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art," citing from *Ex parte Levy*, 17 USPQ2d, 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). In the present situation, the disclosure that the surface 18 may be curved does not *necessarily* mean that this surface is concave. In fact, in the rejection of Claim 1 (discussed below), the Examiner interprets this same statement to mean that the surface 18 is convex. If it can be convex, it cannot necessarily be concave. Hence, the mere suggestion in the reference that the surface 18 may be curved does not constitute a disclosure that the surface is concave, as recited in the Claim 25.

"To anticipate a claim, the reference must teach *every* element of the claim." MPEP §2131, emphasis added. The Braun patent does not teach that the first surface 18 is concave, either explicitly or inherently. Nor does it contain any disclosure suggesting that a concave surface would be desirable in the context of its range boresight test unit. Since

the reference does not disclose at least this claimed element, it does not anticipate Claim 25.

B. It Is Not Obvious to Modify the Teachings of the Braun Patent in View of the Medina Puerta Patent

1. Claims 1, 2, 13, 14, 23 and 24

Claims 1, 2, 13, 14, 21-24 and 26 stand finally rejected under 35 U.S.C. §103, as being unpatentable over the Braun patent in view of the Medina Puerta et al. patent.

Independent claims 1 and 13 each recite, among other features, a lens element having a first surface that is convex to the long conjugate distance side, i.e., surface S1, and "a second aspherical surface convex to a side opposite to the long conjugate distance side."

Dependent claim 23 also recites that the second surface is convex. The rejection alleges that the Braun patent discloses all the elements recited in these claims, with the exception of a second surface that is aspherical. For this purpose, it relies upon the Medina Puerta et al. patent, which discloses an optical device having two opposed aspherical surfaces. The rejection concludes that it would be obvious to place an aspherical surface on the second surface of the optical lens of the Braun patent.

Such a modification of the boresight test unit of the Braun patent would not, in fact, be obvious, since it is directly contrary to the explicit teachings of that patent. Throughout its disclosure, the Braun patent teaches that the second surface 22, 22a, 64 and 107 in its various embodiments has a spherical shape. See, for example, column 2, lines 42 and 44; column 4, lines 20-21 and 30-31; and column 5, lines 11-12, 13, 19-20, 26 and 61-62. At each of these locations the patent explicitly discloses that the shape of the second surface is spherical. More importantly, at column 6, lines 35-38, the patent states, "The optical structure is not limited to any particular configuration in accordance with the invention *but requires a spherical shaped surface and at least one additional surface.*" (emphasis added). This explicit statement that the optical element of the Braun patent "requires" a spherical surface would not lead a person of ordinary skill in the art to employ a lens element with an

aspherical shape on its second surface, since it would be directly contrary to the teachings of the patent.

In responding to this line of argument, the final Office Action states:

Braun...doesn't state that the invention cannot incorporate an aspherical surface, Braun is merely disclosing that his lens has a spherical surface. (Office Action dated September 16, 2002, paragraph bridging unnumbered pages 7-8).

The Braun patent does not "merely" disclose that the lens has a spherical surface. Rather, the Braun patent "requires" that the second surface be spherically shaped. Consistent with this requirement, it is to be noted that each of the independent claims of the Braun patent explicitly states that a surface of the optical structure is spherically curved. By explicitly *requiring* that the surface be spherical in shape, the Braun patent clearly is teaching away from using optical surfaces having different shapes, e.g. aspherical. When considering the teachings of the reference as a whole, one of ordinary skill in the art would not be motivated to modify the Braun patent as suggested in the rejection.

The fact that the patent doesn't explicitly state that the invention cannot incorporate an aspherical surface does not, by itself, make the use of an aspherical surface obvious. In this regard, the final Office Action states:

The bottom line is, taking a lens and placing an aspherical surface on one side or both of the lens to correct for aberrations has been commonly done for years and I could pull hundreds of optical system which have done this.

This statement does not support the current grounds of rejection. The *only* rejection of record is based upon the Braun patent, and that patent teaches *away* from using an aspherical surface, since it "requires" a spherical surface. If the Examiner believes that there is other available prior art that discloses the use of an aspherical surface and that would support a rejection of the claims, it is incumbent upon him to cite such art and apply

it against the claims. Until such time as that is done, Appellants can only address the issues raised by the rejection based upon the Braun patent. As discussed above, the disclosure of *that* patent is not sufficient to support a rejection of the claims. Appellants should not be forced to speculate about what other patents may disclose.

2. Claims 21 and 22

Claims 21 and 22 do not explicitly require the second surface to be aspherical. Claim 21 recites that at least one of the surfaces has an aspherical shape, and Claim 22 recites that the first surface is aspherical. Neither the Office Action nor the references provide any motivation to employ an aspherical shape for either of the surfaces of the optical structure 20 of the Braun boresight test unit.

The Medina Puerta patent is directed to imaging devices, e.g. microscopes, telescopes, binoculars, cameras, etc. (see column 4, lines 6-9). In devices of these types, it is known to use aspherical lens surfaces to correct for aberrations that could distort the resulting image to be viewed.

In contrast, the Braun patent is directed to a boresight tester. The operating principle of this device does not rely upon an image of an object, or the like. Rather, the proper alignment of the boresight is determined by the *amount* of light that is returned to the receiver 12. See column 4, lines 1-13.

There is no teaching in either of the references that the quality of an image formed by an optical element is important in the operation of a boresight tester. As such, there is no apparent reason to use an aspherical shape for either of the surfaces of the optical structure 20 of the Braun patent.

C. Claims 9, 10 and 28

As noted previously, the final Office Action does not set forth a rejection of claims 9, 10 or 28. However, these claims are said to be rejected on the Summary sheet for the

Office Action, as well as in the Advisory Action mailed January 10, 2003. For the sake of completeness, the subject matter of these claims will also be addressed.

1. Claims 9 and 10

Claim 9 recites that the lens element has a first surface concave to the long conjugate distance side and a second aspherical surface convex to a side opposite to the long conjugate distance side. As acknowledged in the Office Action, the Braun patent does not teach a second surface having an aspherical shape. Furthermore, as discussed previously in this Brief, the Braun patent actually teaches *away* from using anything but a spherical shape for the second surface. Hence, the subject matter of claim 9 is not suggested by the Braun patent, since it would not be obvious to modify its teachings to incorporate an aspherical surface.

Claim 10 depends from claim 9 and is therefore not obvious for at least this reason.

2. Claim 28

Claim 28, like claim 25, recites a lens element having a first surface that is concave to the long conjugate distance side. As discussed previously in connection with claim 25, the Braun patent does not disclose that its optical element has a first surface 18 that is concave.

Claim 28 further recites that the luminous flux passing through the optical system is imaged on the optical axis of the lens element after only two reflections. As illustrated in the various embodiments shown in the figures, in the lens element a light ray enters the peripheral portion of the first surface, is reflected once at the peripheral portion of the second surface, and is reflected again at the central portion of the first surface. Upon being reflected the second time, the light rays are imaged at a point along the optical axis of the lens element.

In contrast, the Braun patent discloses that the incoming light beam is reflected multiple times on each of the first and second surfaces before it reaches the focal point 24. Each reflection results in a loss of some of the received light. In fact, this concept is

explicitly acknowledged in the Braun patent, at column 2, lines 46-52. When a lens element is used for imaging purposes, which is one of the applications of the present invention, such losses can be highly disadvantageous. By limiting the number of reflections within the lens element, as recited in claim 28, the losses can be reduced, resulting in a higher quality image.

For this additional reason, therefore, the Braun patent does not disclose, nor otherwise suggest, the subject matter of claim 28.


IX. Conclusion

In summary, the Braun patent does not anticipate claim 25, since it does not disclose every element of that claim, either explicitly or inherently. Furthermore, it would not be obvious to modify the teachings of the Braun patent to utilize a surface having an aspherical shape, particularly since the Braun patent explicitly requires a surface having a spherical shape. As such, it does not suggest the subject matter of the claims that stand finally rejected.

The rejections of the claims are not properly founded in the statute, and should be reversed.

Respectfully submitted,

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APPENDIX A

The Appealed Claims

1. An optical system comprising,
a lens element for focusing incident luminous flux at a predetermined position, said lens element having, from a long conjugate distance side, a first surface convex to the long conjugate distance side and a second aspherical surface convex to a side opposite to the long conjugate distance side,
wherein the luminous flux passing through a peripheral part of said first surface is reflected at a peripheral part of said second surface, is again reflected at a central part of said first surface and imaged on an optical axis of the lens element.
2. An optical system as claimed in claim 1,
wherein said first surface and said second surface are both aspherical.
9. An optical system comprising,
a lens element for focusing incident luminous flux at a predetermined position, said lens element having, from a long conjugate distance side, a first surface concave to the long conjugate distance side and a second aspherical surface convex to a side opposite to the long conjugate distance side,
wherein the luminous flux passing through a peripheral part of said first surface is reflected at a peripheral part of said second surface, is again reflected at a central part of said first surface and imaged on an optical axis of the lens element.
10. An optical system as claimed in claim 9,
wherein said first surface and said second surface are both aspherical.

13. An optical system comprising a lens element having a first convex surface on the long conjugate distance side thereof with a reflective coating on a central portion thereof and a light admitting area on said convex surface at the periphery of said reflective coating, and a second aspherical convex surface on the opposite side thereof with a reflective coating on a peripheral portion thereof and a light transmissive region at the central portion thereof.

14. The optical system of claim 13 wherein both of said first and second surfaces have an aspherical shape.

21. The optical system of claim 25 wherein at least one of said surfaces has an aspherical shape.

22. The optical system of claim 21 wherein said first surface has an aspherical shape.

23. The optical system of claim 21 wherein said second surface has an aspherical shape.

24. The optical system of claim 13 wherein said lens element is made of molded glass.

25. An optical system comprising a lens element having a first concave surface on the long conjugate distance side thereof with a reflective coating on a central portion thereof and a light admitting area on said concave surface at the periphery of said reflective coating, and a second convex surface on the opposite side thereof with a reflective coating on a peripheral portion thereof and a light transmissive region at the central portion thereof.

26. The optical system of claim 25 wherein said lens element is made of molded glass.

28. An optical system comprising,
a lens element for focusing incident luminous flux at a predetermined position, said lens element having, from a long conjugate distance side, a first surface concave to the long conjugate distance side and a second surface convex to a side opposite to the long conjugate distance side,

wherein the luminous flux passing through a peripheral part of said first surface is reflected once at a peripheral part of said second surface, is thereafter reflected a second time at a central part of said first surface and imaged on an optical axis of the lens element upon said second reflection.